

ZOOLOGY.—*A new crayfish of the genus Procambarus from Oklahoma and Arkansas (Decapoda, Astacidae).*<sup>1</sup> HORTON H. HOBBS, Jr., Miller School of Biology, University of Virginia. (Communicated by F. A. CHACE, Jr.)

The new crayfish herein described was collected from two localities in the headwaters of Little River in Oklahoma and Arkansas by Dr. Charles E. Burt on June 3, 1934, and the specimens were deposited in the collection of the United States National Museum.

Only three species of the genus *Procambarus* [*P. simulans* (Faxon, 1884: 112), *P. gracilis* (Bundy, 1876: 5), and *P. blandingii acutus* (Girard, 1852: 91)] were reported to occur in Oklahoma by Creaser and Ortenburger (1933), and with the addition of the new species described below, 12 species of crayfishes are now known to be present in the State.

No comprehensive survey of the crayfishes of Arkansas has been made; however, the following species of the genus *Procambarus* are known to occur within its political boundaries: *P. clarkii* (Girard, 1852: 91), *P. blandingii acutus* (Girard), *P. gracilis* (Bundy), *P. simulans* (Faxon), and *P. viaviridis* (Faxon, 1914: 370).

A key for the identification of the crayfishes of the genus *Procambarus* occurring in Oklahoma and Arkansas is included below.

I wish to express my appreciation to Dr. Burt for supplying me with the data for the specimens on which this new species is based.

*Procambarus tenuis*, n. sp.<sup>2</sup>

*Diagnosis.*—Rostrum without lateral spines and acumen indistinctly set off from basal portion; areola narrow with only two punctations in narrowest part; cephalothorax strongly compressed and bearing prominent setiferous punctations between which are crowded numerous smaller ones. Male with hooks on ischiopodites on third and fourth pereopods; palm of chela of first form male not bearded but bearing a row of seven to nine tubercles along inner margin; postorbital ridges terminating cephalad without spines or tubercles; lateral surface of carapace without spines. First pleopod of first form male

terminating in three distinct parts: the non-corneous mesial process thin, triangular, and directed caudally at almost a right angle to the main shaft of the appendage; the plate-like cephalic process, which is contiguous with the mesial one, extends caudodistad from the mesiodistal surface; the corneous central projection, the most prominent of the three terminal elements, arises from the lateral half of the distal end of the appendage, is somewhat compressed and tapering and directed distad and caudomesiad; caudal element represented by a slight knob at the caudolateral base of the central projection. Annulus ventralis with extremely high caudal wall (see Fig. 7).

*Holotypic male, form I.*—Body ovate, strongly compressed laterally; abdomen narrower than thorax (9.9–10.8 mm in widest parts respectively); width of carapace less than depth in region of caudodorsal margin of cervical groove (10.8–11.5 mm).

Areola narrow, about 16 times longer than broad with two rows of punctations in narrowest part; cephalic section of carapace about 2.3 times as long as areola (length of areola about 30.4 percent of entire length of carapace).

Margins of rostrum converging cephalad to a small corneous upturned apical tubercle; margins somewhat swollen and subtended mesially by a row of setiferous punctations; concave upper surface with a few similar scattered punctations.

Postorbital ridges deeply grooved laterad and terminating cephalad bluntly; subrostral ridges weak and evident in dorsal aspect for only a short distance at base of rostrum; suborbital angle obtuse; branchiostegal spine small and blunt; sides of carapace without spines or tubercles. Surface of carapace punctate except along cephaloventral margin where it is granulate.

Abdomen slightly shorter than thorax (25.9–26.6 mm).

Cephalic section of telson with two spines in each caudolateral corner.

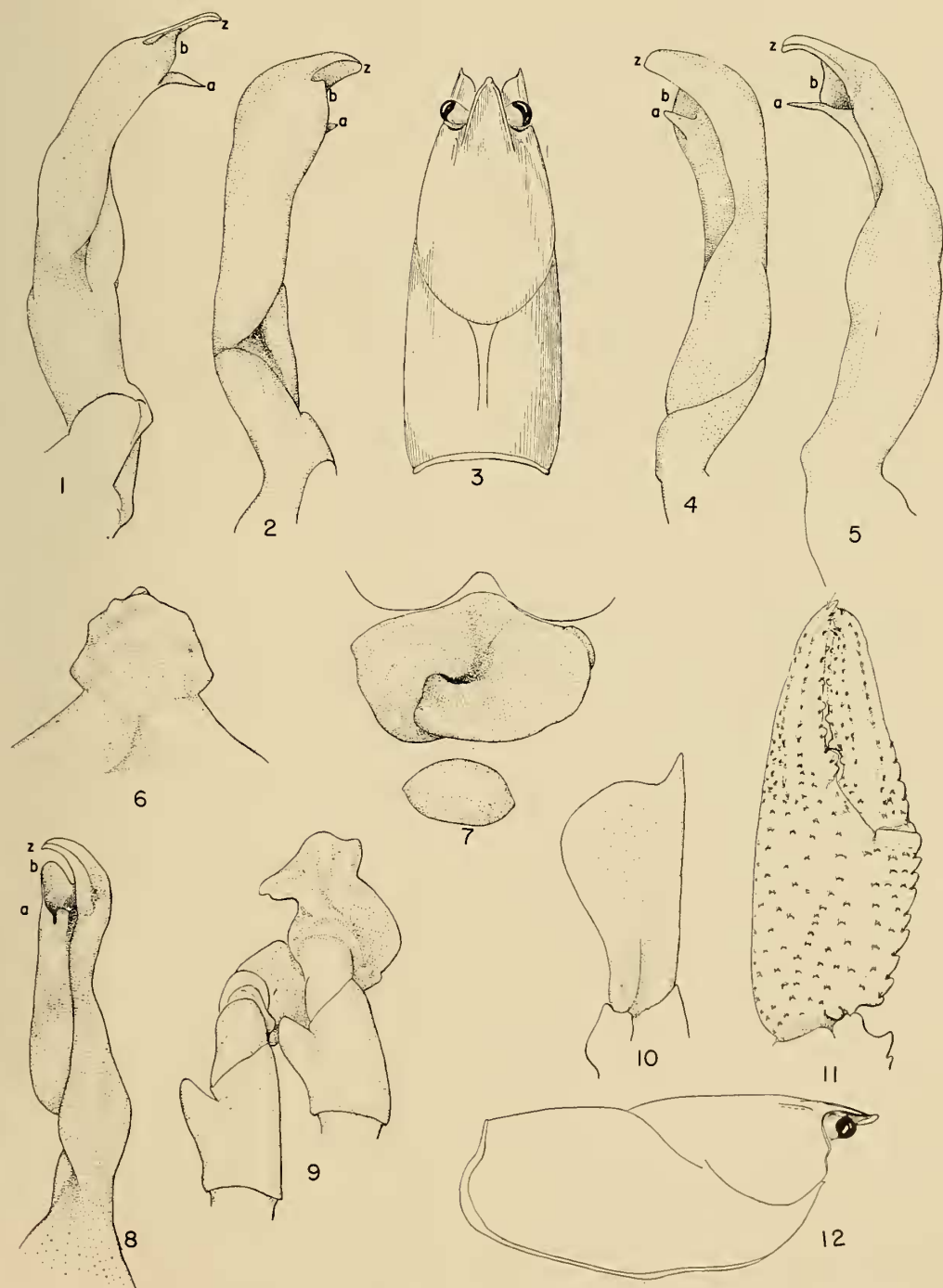
Epistome subtrapezoidal in outline with a small cephalomedian projection; cephalolateral portions inflated.

Antennules with the usual small spine on ventral surface of basal segment.

Antennae extend caudad to sixth abdominal

<sup>1</sup> Received March 24, 1950.

<sup>2</sup> The name *tenuis* refers to the slender (compressed) carapace.



FIGS. 1-12.—*Procambarus tenuis*, n. sp.: 1, Mesial view of first pleopod of holotype; 2, Mesial view of first pleopod of morphotype; 3, Dorsal view of carapace of holotype; 4, Lateral view of first pleopod of morphotype; 5, Lateral view of first pleopod of holotype; 6, Epistome of holotype; 7, Annulus ventralis of allotype; 8, Caudal view of first pleopod of holotype; 9, Basal portions of third and fourth pericopods of holotype; 10, Antennal scale of holotype; 11, Upper view of chela of holotype; 12, Lateral view of carapace of holotype. (a—mesial process, b—cephalic process, z—central projection.) (Pubescence removed from all structures illustrated except in Fig. 11.)

segment; antennal scale broad with a well developed spine on outer distal margin; lamellar portion with rounded inner margin and broadest distad of middle (Fig. 10).

Left chela (right lacking) moderately heavy (Fig. 11); palm slightly inflated and studded with setiferous squamous tubercles on upper surface. Inner margin of palm with a row of eight prominent tubercles and a few squamous ones subtending this row above and below. Lower surface of palm with setiferous punctations except near base of immovable finger where punctations give way to setiferous squamous tubercles; a prominent corneous-tipped tubercle present at base of movable finger. Fingers only slightly gaping. Opposable margin of dactyl with six evenly spaced rounded tubercles along basal two-thirds, the proximal three larger than the distal ones, and the second distinctly larger than the first; distad of and between these tubercles are crowded minute denticles; upper surface with a submedian longitudinal ridge flanked on each side by a row of setiferous punctations, and in addition bearing a few squamous tubercles near base and scattered punctations laterad of the ridge; lower surface of dactyl similar to upper surface; lateral margin of dactyl with a row of three tubercles on basal third, distad of which is a row of setiferous punctations. Opposable margin of immovable finger with five tubercles along basal three-fifths and an additional one on lower opposable margin at base of distal fourth, the proximal four larger than the distal two, and the proximal two contiguous; a row of minute denticles between and distad of this row of tubercles; other surfaces as described for dactyl.

Carpus of first left pereiopod about 1.6 times longer than broad with a shallow oblique furrow above; surface laterad of furrow punctate; that mesiad of it with a row of setiferous punctations, and mesiad of the latter a row of four small tubercles; mesial surface of carpus with seven tubercles, four of which are evident in upper aspect and progressively larger distad; lower mesial margin with a row of five tubercles, the distomarginal one decidedly larger than others; lateral surface of carpus with setiferous punctations and a prominent tubercle on lower distal angle.

Merus of first left pereiopod with a row of 16 tubercles on upper margin and with a few additional ones flanking this row distally; lateral and mesial surfaces with setiferous punctations; lower

surface with a lateral row of nine spikelike tubercles and a mesial one of 14, and an additional tubercle present between the distal members of these two rows.

Ischiopodites of third and fourth pereiopods with hooks; hooks simple and concave proximad. Coxopodites of fourth and fifth pereiopods with ventrally projecting prominences, those on fourth large, complex, and with a prominent cephalo-median extension; those on fifth small, slender, and subacute.

First pleopod reaching coxopodite of third pereiopod when abdomen is flexed; pleopods symmetrical, their cephalic surfaces convex and without a prominent hump. (See description of pleopod under Diagnosis.)

*Morphotypic male, form II.*—Differs from the holotype in the following respects: in the absence of suborbital angles and a few very slight differences in tubercle counts; the usual secondary sexual differences occur, however, all terminals of first pleopods except caudal element evident.

*Allotypic female.*—Differs from the holotype in the following respects: Branchiostegal spines well defined and acute; suborbital angles almost obsolete. Opposable margin of dactyl with seven tubercles on basal four-fifths, the second, third and fourth from base largest, the second so distinctly larger than the first that a distinct emargination occurs immediately proximad of the former with the basal tubercle in the emargination; mesial surface of dactyl with only two proximal tubercles; opposable margin of immovable finger with only four tubercles on basal three-fifths; armature of merus and carpus reduced both in number and size of tubercles.

Annulus ventralis subovate in outline with the greatest length in the transverse axis; caudal and dextral walls high; central area with a broad, shallow funnellike depression. Sinus originates in subcentral depression and crosses caudal wall distinctly dextrad of median line (see Fig. 7).

*Measurements.*—As follows (in millimeters):

	Holotype	Allotype	Morphotype
Carapace—height.....	11.5	11.4	11.2
width.....	10.8	9.4	9.5
length.....	25.6	24.0	24.7
Areola—length.....	9.0	8.5	9.1
width.....	0.5	0.5	0.6
Rostrum—length.....	4.5	3.9	4.2
width.....	4.0	3.2	3.5
Left chela—length, inner margin			
of palm.....	9.2	7.0	7.3
width of palm.....	8.9	8.3	8.5
length, outer margin			
of hand.....	23.2	17.0	19.3
length of dactyl.....	13.2	10.1	10.8

*Type locality.*—"Six miles east of Page and just west of Oklahoma state line, Le Flore Co., Oklahoma. In spring at base of 'mountains,' a tributary of the Little River.

*Disposition of types.*—The holotypic male, form I, allotypic female, and morphotypic male are in the United States National Museum (no. 90390). Of the 23 paratypes, one male, form I, one male, form II, and one female are in my personal collection at the University of Virginia (no. 6-334-1); one male, form I, five males, form II, five females, four immature males, and five immature females are in the United States National Museum (nos. 90391, 90392).

*Specimens examined.*—All specimens collected on June 3, 1934, by Charles E. Burt. From the type locality: 3 ♂ ♂ I, 6 ♂ ♂ II, 4 ♀ ♀, 2 ♂ ♂ imm., and 4 ♀ ♀ imm. From 6 miles northwest of Rich Mountain, Polk County, Ark., just east of state line: 1 ♂ II, 3 ♀ ♀, 2 ♂ ♂ imm., 1 ♀ imm. Both of these localities are on tributaries of the Little River.

*Variations.*—Except for the differences pointed out in the above descriptions the variations among the specimens at hand are minor ones. In the females mirrored images of the annulus ventralis of that figured for the allotype occur.

*Relationships.*—*Procambarus tenuis* is a somewhat disjunct member of the genus *Procambarus*. Although its affinities appear to be with the members of the *Blandingii* section (see Hobbs, 1942: 93) the cephalic process of the first pleopod of the male arises from the mesial surface of the appendage, and under the cited definition this would exclude *tenuis* from this section of the genus; furthermore, it does not conform to the definitions of any of the other sections. In the practically obsolete caudal process of the first pleopod *tenuis* approaches *Paracambarus paradoxus* (Ortmann, 1906: 3)<sup>3</sup>; also in the latter species the cephalic process arises from the mesial side of the appendage although it is not nearly so strongly developed as that in *tenuis*. There is little reason to believe that these resemblances actually indicate close affinities, for except for these features the pleopods of the two species are distinctly different. It is more probable that *tenuis* is more closely allied to *Procambarus blandingii acutus* (Girard, 1852: 91) than to any other described species.

<sup>3</sup> Redescribed and carefully figured by Villalobos 1947: 233 (see pl. 3, fig. 1).

KEY TO THE CRAYFISHES OF THE GENUS PROCAMBARUS IN OKLAHOMA AND ARKANSAS

1. Areola obliterated at least in middle. . . . . 2  
    Areola broad or narrow but never obliterated. . . . . 3
2. Outer half of upper surface of palm of chela tuberculate above; movable finger without an excision on opposable margin near base; acumen distinctly set off from remainder of rostrum; suborbital angle not well defined; ischiopodites of third and fourth pereopods in male bearing hooks; annulus ventralis without tubercles on cephalic half. . . . . *clarkii*  
    Outer half of upper surface of palm of chela punctate above; movable finger with a distinct excision on opposable margin near base; acumen not distinctly set-off from remainder of rostrum; suborbital angle well defined; male with ischiopodites of third pereopods only bearing hooks; annulus ventralis bearing tubercles on cephalic half. . . . . *gracilis*
3. Acumen distinctly set off from base of rostrum. . . . . *blandingii acutus*  
    Acumen absent or not clearly set off from base of rostrum. . . . . 4
4. Males. . . . . 5  
    Females. . . . . 7
5. Hooks on ischiopodites of third pereopods only. . . . . *simulans*  
    Hooks on ischiopodites of third and fourth pereopods. . . . . 6
6. Carapace strongly compressed; central projection of first pleopod distinctly longer than other terminal elements. . . . . *tenuis*  
    Carapace not markedly compressed; central projection of first pleopod not longer than other terminal elements. . . . . *viac-viridis*
7. Annulus ventralis with longitudinal ridges in cephalic half bearing tubercles. . . . . *simulans*  
    Annulus ventralis without longitudinal ridges bearing tubercles. . . . . 8
8. Caudal wall of annulus ventralis high, and with a distinct median depression; sinus cuts caudal wall distinctly to right or left of median line of annulus ventralis. . . . . *tenuis*  
    Caudomedian wall of annulus ventralis low, but with a high cephalic wall bearing a median cleft; sinus cuts caudal wall near median line of annulus ventralis. . . . . *viac-viridis*

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## PROCEEDINGS OF THE ACADEMY

### 52D ANNUAL MEETING

The 52d Annual Meeting, concurrently with the 369th monthly meeting of the Academy, was held as a dinner meeting in the Palm Room of Hotel 2400 on January 28, 1950, at 6:30 P.M. President F. H. H. ROBERTS, JR., presided.

After the dinner, Dr. Roberts called the meeting to order and introduced the speaker, HERBERT FRIEDMANN. Dr. Friedmann gave an illustrated talk dealing with the symbolism portrayed on two of the Medici tombs by Michelangelo. He analyzed the use of an owl and a wild cat to show Michelangelo's subtle interpretation of some aspects of the Medici family on the monumental tombs he created for two of the Medici.

The minutes of the 51st Annual Meeting were approved as published in the JOURNAL 39: 206-213. 1949.

The following reports by the various officers, standing committee chairmen, auditors, and tellers were read and accepted:

#### REPORT OF THE SECRETARY

During the Academy year, January 22, 1949, to January 28, 1950, there were 56 persons elected to regular membership, including 50 to resident and 6 to nonresident. Of these, 38 resident and 5 nonresident qualified for membership. Eight resident members and one nonresident member elected to membership in the preceding Academy year qualified during the present Academy year just ending. The new members were distributed among the various sciences as follows: 14 in chemistry, 6 each in mathematics and physics, 5 in plant pathology, 4 each in geology and geophysics, 2 each in archeology, bacteriology, engineering, medicine, and physiology, and 1 each in biochemistry, botany, conservation, genetics, ichthyology, mechanical engineering, and natural history.

Five resident and three nonresident members, having retired from the gainful practice of their professions, were placed on the retired list of members to enjoy all the privileges of active membership without further payment of dues. Eight resident members and three nonresident members resigned in good standing.

The deaths of the following members were reported to the Secretary:

- CARL F. A. CHRISTENSEN, Copenhagen, Denmark, on November 24, 1942.
- GEORGE TULLY VAUGHAN, Washington, D. C., on April 26, 1948.
- EDWARD R. STITT, Washington, D. C., on November 13, 1948.
- STEPHEN R. CAPPS, Washington, D. C., on January 19, 1949.
- S. H. McCORRY, Washington, D. C., on February 18, 1949.
- BAILEY WILLIS, Stanford University, Calif., on February 19, 1949.
- SAMUEL F. HILDEBRAND, Washington, D. C., on March 16, 1949.
- GEORGE B. RICHARDSON, Washington, D. C., on March 18, 1949.
- WILLIAM B. BELL, Washington, D. C., on March 30, 1949.
- JOSEPH A. CUSHMAN, Sharon, Mass., on April 16, 1949.
- WHITMAN CROSS, Chevy Chase, Md., on April 20, 1949.
- O. F. COOK, Washington, D. C., on April 23, 1949.
- PHILIP S. SMITH, Washington, D. C., on May 10, 1949.
- ALFRED P. D. STOKES, Riverside, Calif., on May 17, 1949.
- JOHN M. COOPER, Washington, D. C., on May 22, 1949.
- SIGURD ORLA-JENSEN, Copenhagen, Denmark, on June 24, 1949.
- H. M. GOODWIN, Cambridge, Mass., on June 26, 1949.
- CHARLES J. BRAND, Washington, D. C., on June 29, 1949.